Chapter 11

5 A Day Research With African-American Churches and the Special Supplemental Nutrition Program for Women, Infants, and Children

Marci K. Campbell, Stephen Havas, Bethany Jackson, Dorothy Damron, Jacquelyn McClelland, Jean Anliker, Wendy Demark-Wahnefried, Patricia Langenberg, Arnette Cowan, Robert Feldman, and Brenda McAdams Motsinger

INTRODUCTION

This chapter presents two of the nine randomized community-based research trials of the National Cancer Institute's (NCI's) 5 A Day for Better Health Program that specifically focused on reaching lower income and minority populations (see Table 1 for project summaries). These populations are of special concern because they have higher rates of cancer and other chronic diseases. In particular, incidence rates for certain cancers, such as prostate, lung, and colorectal, are higher for African-Americans than for Whites, and survival rates are lower for African-Americans (Landis et al., 1998). In addition, when compared to higher income groups, lower income populations have higher cancer mortality rates, which may be related to poorer health care and later stages of diagnosis (Kington and Smith, 1997; Mayberry et al., 1995; Winkleby et al., 1992). The racial and socioeconomic discrepancies in morbidity and mortality have provided the impetus for identifying African-American and lower income groups as special target populations for health promotion efforts, such as the 5 A Day Program (Havas et al., 1994; U.S. Department of Health and Human Services, 1990).

Certain specific demographic subgroups have been shown to consume fewer vegetables and fruit than the population average. For example, younger individuals tend to consume fewer vegetables and fruit when compared to older persons, and men typically consume fewer vegetables and fruit when compared to women (Patterson et al., 1990; McClelland et al., 1998). Patterson and colleagues found that women in the lowest income bracket (below 131 percent of the poverty line) consumed fewer vegetables and fruit when compared to higher income women. There are recent indications that a secular trend of

Table 1. Project Summaries

Project Name	*Lead Agencies*	*Target Groups*	*Intervention Elements*	*Theories Used in Intervention*	*Community Collaborators*
Maryland WIC 5 A Day Promotion Program	• University of Maryland • Maryland Department of Health and Mental Hygiene	Women receiving WIC benefits for themselves or their children	• Peer educators conducted education sessions • Printed materials and visual reminders • Tailored mail	• Stages of Change • Social Cognitive Theory	• Local health departments' WIC sites
Black Churches United for Better Health (North Carolina)	• North Carolina Department of Health and Human Resources • University of North Carolina • Duke University • North Carolina State University	African-American adult churchgoers	• Tailored bulletins • Educational sessions • Lay health advisers • Community coalitions • Point-of-purchase promotions • Pastor and church support	• Stages of Change • PRECEDE-PROCEED • Social support • Health Belief Model • Social Cognitive Theory	• Local health departments and Cooperative Extension Service • 50 churches in 10 counties • Other community groups

increasing consumption rates overall in the United States, at least partly fostered by the national 5 A Day Program, is not mirrored in ethnic minority populations (Gregson et al., 1997).

NEED FOR TARGETED AND CULTURALLY SENSITIVE INTERVENTIONS

Most traditional health promotion programs and campaigns have not focused on minority and underserved groups. These populations often have greater difficulty in obtaining preventive health education and services due to such barriers as financial constraints, lack of transportation, and especially in rural areas, less access to quality health care. Barriers more specifically related to eating five servings a day may include socioeconomic factors, such as the real and perceived costs of purchasing vegetables and fruit, the lack of transportation to supermarkets where fresh produce is available, and a lack of knowledge about nutritional recommendations. Cultural differences in food habits may make it difficult for certain people to change eating behaviors. For example, among African-Americans in the southeastern United States, cultural norms for good food emphasize high-fat foods, such as fried chicken, biscuits and gravy, and greens seasoned with pork fat (Whitehead, 1992). Changing these habits, therefore, may conflict with social norms and expectations surrounding food events, such as Sunday dinners, church suppers, and other gatherings.

Cultural and social factors also may render health messages designed for the population at large less effective at motivating less-advantaged groups. For example, there is evidence that major media campaigns to promote awareness of AIDS, sudden infant death syndrome (Gibson et al., 1998; Willinger et al., 1998), and other health issues have influenced a smaller proportion of minority populations when compared with the White population. Research on diffusion of innovations has indicated that populations respond to innovations differentially (Rogers, 1983). Earlier adopters of innovations tend to be better educated, have a higher income, seek information more readily, and pay closer attention to the media. Later adopters tend to be minorities, have lower incomes, and get information through social exchange rather than through the media. The Diffusion of Innovations Model would suggest that methods designed for the early adopters, such as mass media campaigns and distribution of

printed materials, would be less effective with lower income and minority populations. Instead, settings that have social contexts and models that include peer education and social support would be more likely to promote adoption of new behaviors among members of these populations (Israel, 1985).

At the initiation of NCI's 5 A Day Program, there were relatively few studies targeting lower income younger people or African-American church members for chronic disease prevention or for dietary change in particular. Existing research, though generally lacking in randomized evaluation designs, indicated that churches and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) might be effective channels for improving behaviors related to other issues, such as cardiovascular disease risk reduction and breast-feeding promotion (Eng and Hatch, 1991; Hatch and Derthick, 1992; Schwartz et al., 1995; Voorhees et al., 1996; Rush et al., 1988a; New York State, 1991; Schramm, 1985; Kotelchuck et al., 1984; Kennedy and Gershoff, 1982). None of these studies focused specifically on increasing vegetable and fruit consumption, however. The following summarizes the reasons why the Maryland and North Carolina 5 A Day research teams chose the channels that they did to reach the target audiences.

WORKING WITH CHURCHES

Nontraditional channels are often employed to deliver health-based interventions to populations that are sometimes considered hard to reach or that distrust traditional health care channels. These populations are not necessarily hard to reach, but researchers usually have not paid adequate attention or learned the best ways to reach them. In targeting rural African-Americans, who represent a high-risk population for cancer as well as other chronic diseases, African-American churches were selected as a channel for several reasons. First, churches have a history of providing help to their members. Historically, the church has been the most important institution in the African-American community and has provided tangible aid for those in need, as well as social and spiritual support. Second, because most adult African-Americans—as many as 80 percent or more—attend church regularly, partnering with churches can mean reaching and recruiting a large percentage of the target population (Hatch and Derthick, 1992; Lincoln and Mamiya, 1990). Third, the church organization can provide the infrastructure and support to facilitate and maintain social and environmental change. Churches offer a wealth of resources, including members who can provide professional and lay health input and feedback, facilities for food preparation, and space for meetings. Finally, working with churches can help researchers understand and utilize the cultural, social, and spiritual aspects of health promotion that can lead to stronger interventions.

A number of researchers have developed methods and models of reaching African-Americans by working with churches through health programs, particularly for cardiovascular disease and cancer risk reduction (Kumanyika, 1992; Lasater et al., 1997; Voorhees et al., 1996; Schorling, 1995). Few studies, however, have worked with churches to incorporate health messages into the religious aspects of church life, and few have used strong research designs (such as randomized trials) to evaluate these programs.

WORKING WITH WIC

The WIC program provides vouchers for supplemental foods to low-income women who are pregnant or postpartum, breast-feeding, or have children younger than 5 years of age and are deemed to have nutrition-related risks. This program provides a limited amount of nutrition education on a variety of subjects to these women. The program operates in all 50 States, the District of Columbia, and all U.S. territories; it provides services to about 7.1 million clients annually.

WIC program participants were selected as a target population because successful intervention strategies could be replicated nationwide, as well as other reasons. First, WIC participants represent a large low-income population, many of whom are racial minorities. Second, women enrolled in the WIC program may be particularly amenable to changing their food consumption patterns because of concern for their children. Third, directing behavior change interventions to this population may ultimately improve the eating

behaviors of other individuals in the household. Fourth, despite the program's services, the diets of WIC participants frequently remain inadequate. Fifth, WIC participants are certified every 6 months and pick up food vouchers bimonthly, theoretically providing an excellent opportunity for regular contact.

Although widespread, the WIC program has been used infrequently as a setting for research. No research prior to this 5 A Day effort focused on nutrition education aimed at reducing WIC participants' risk of developing chronic diseases. Previous studies have credited the WIC program with increasing birth weights, decreasing premature births, preventing anemia in children and pregnant women, and decreasing Medicaid costs among program participants. However, these results were not demonstrated through the use of randomized clinical trials but rather through a comparison of WIC participants with nonparticipants (Rush et al., 1988; New York State, 1991; Schramm, 1985; Kotelchuck et al., 1984; Kennedy and Gershoff, 1982; Kennedy et al., 1982). In such nonrandomized studies, it is difficult to establish that the findings were not largely attributable to selection bias, such as differences between WIC participants and nonparticipants (Abrams, 1992). The only previously published study that randomized WIC participants to assess the effectiveness of interventions, a study concerning the impact of food vouchers on infant birth weights, did not show a statistically significant effect (Metcoff et al., 1985).

DESIGN AND EVALUATION OF THE INTERVENTIONS

In the next section, both the Maryland and North Carolina 5 A Day projects will be described in terms of the following elements: project overview and design, formative research, intervention strategy, barriers, results, and lessons learned. Table 2 provides a summary of the evaluation designs. Because of the limited amount of previous research that was directly applicable to these studies, both projects undertook extensive formative research to determine the concerns, priorities, and preferences of the target audiences. In addition, each project faced unique barriers to conducting research in the chosen setting. Elucidating how the projects overcame those barriers, or failed to overcome them, can provide valuable insights into the nature of community-based research among minority and lower socioeconomic-status populations.

Maryland WIC 5 A Day Promotion Program

Overview and Design

The Maryland WIC 5 A Day Promotion Program was a cooperative effort by the University of Maryland at Baltimore, the University of Maryland at College Park, the Maryland Department of Health and Mental Hygiene, and local health departments along with their WIC programs. The program's primary goal was for intervention participants to increase their consumption of vegetables and fruit by at least 0.5 serving per day. Secondary goals included positive movement to higher stages of change, improved attitudes, increased self-efficacy, and decreased perceived barriers toward consuming more vegetables and fruit.

During an initial 9-month planning phase, study researchers conducted extensive formative research (described below). They also discovered that the WIC program has a very high 1-year participant turnover rate (Hammad et al., 1997) and decided that their originally planned yearlong intervention program was not feasible. A more intensive 6-month intervention approach was therefore developed and pilot-tested (Havas et al., 1997). Following the pilot test, the interventions were refined before the full-scale study was conducted, in order to boost recruitment, attendance, dietary change, and survey completion rates.

A multifaceted program was implemented using a randomized crossover design for a total of 16 WIC sites located in Baltimore City and in six Maryland counties. Eight sites were randomized to intervention status and eight to control status for Phase 1 of the study; recruitment then began at all sites. Written informed consent was obtained from participants under a protocol approved by both of the universities' and the State health department's institutional review boards. To be eligible, women had to be 1) enrolled in the WIC program or have children enrolled, 2) at least 18 years of age, and 3) planning to remain enrolled at that site for at least 6 months.

Table 2. Evaluation Designs

Project Name	*Evaluation Design*	*Measures*	*Measurement Period*	*Number of Participants*	*Age, Gender, Ethnicity*
Maryland WIC 5 A Day Promotion Program	16 WIC sites, randomized crossover design	• NCI seven-item vegetable and fruit food frequency questionnaire • Psychosocial questionnaire	• Baseline • 2 months post-intervention • 1 year after first post-survey	• 3,122 women	• Mean age = 27 • Female = 100% • White = 41% • African-American = 55% • Other = 4%
Black Churches United for Better Health (North Carolina)	10 counties pair-matched and randomly assigned; churches within counties randomly selected/stratified by church size	• NCI seven-item vegetable and fruit food frequency questionnaire • Psychosocial questionnaire	• Baseline • 1-year subsample • 2-year followup of full sample	• 50 churches • 3,737 baseline • 2,519 followup	• Mean age = 53.8 • Female = 72% • African American = 98% • Other = 2%

Four months after the completion of Phase 1, intervention sites became control sites and vice versa. Phase 2 recruitment then began. Because persons enrolled in Phase 1 were ineligible to participate in Phase 2 and only the research staff conducted the interventions, no significant contamination effects occurred. Thus, the 16 sites were able to serve as controls for themselves.

Formative Research

Relatively little was known about the target audience's knowledge, attitudes, and practices concerning vegetables and fruit prior to the pilot test, so the project first explored the target population's shopping, food preparation, and eating practices using focus group discussions of WIC participants (Treiman et al., 1996). Most participants indicated that they spent little time cooking, and few of them regularly used written recipes. In central location intercept interviews (brief, structured discussions with WIC clients waiting to receive vouchers), investigators assessed the frequency of WIC clients eating away from home; overall, 45 percent had eaten at least one meal or snack away from home the previous day. Most had positive perceptions of vegetables and fruit.

Motivations and messages. A theme that repeatedly emerged from the formative research was that women were more concerned about feeding their children healthy foods than about what they themselves ate. Participants did, however, recognize that eating well would be good role modeling for their children. Another repeated theme was that women were concerned about nutrition during pregnancy but that this concern diminished after delivery.

Barriers to increasing consumption. Perceived barriers to increasing the vegetable and fruit consumption of WIC clients were initially explored in the focus-group discussions. Common barriers that emerged included a dislike of specific vegetables and fruit, a preference for other foods, the time and difficulty involved in preparation, cost, and perishability. In the central location intercept interviews, the most frequently cited barriers to buying new kinds of vegetables and fruit were a desire to stick to preferred foods and uncertainty about the taste of the vegetables and fruit. Some women said that it was difficult to get vegetables and fruit when away from home. A frequently cited barrier was the time and effort necessary to prepare vegetables and fruit. Another was not liking vegetables or fruit or preferring some other food. Of note, cost was cited infrequently as a barrier.

Intervention Strategy

The intervention consisted of three components: nutrition sessions conducted by peer educators,

printed materials and visual reminders, and direct mail. The control site participants experienced the normal WIC program, which generally includes less than 10 minutes of nutrition education at the bimonthly voucher pickup. The program was designed to minimize disruption of WIC's procedures and to maximize the limited opportunities available for reaching WIC clientele. The interventions, based on the Transtheoretical Model of Change and Social Cognitive Theory, were designed to enhance self-efficacy and to facilitate movement to higher stages of change (Prochaska and DiClemente, 1982; Bandura, 1989) (see also Appendix D).

Peer-led nutrition education. Peer educators were hired and trained to implement the program. Preference was given to those either presently or formerly enrolled in the WIC program to ensure familiarity with WIC. Peer educators were recruited through recommendations of WIC staff, posters at the WIC sites, and newspaper advertisements. In general, one peer educator was hired for each WIC site.

Peer educators were responsible for all contacts with participants. At program enrollment, the peer educators delivered a brief message regarding increasing vegetable and fruit consumption, followed by a series of three group discussion sessions over 6 months (each lasting about 45 minutes), which all participants were encouraged to attend. During the first session, the women did a brief self-assessment of their vegetable and fruit intake and set a personal goal for eating more. In subsequent sessions, participants talked about their experiences working toward their goals, the barriers they faced, and ways to overcome those barriers. In the last session, participants discussed ways to avoid relapse and maintain their behaviors. Each session included a food demonstration (for example, a vegetable stir-fry) to build participants' skills and self-efficacy and to allow them to try new foods.

Printed materials and visual reminders. The focal piece for the peer-led group discussions was a colorful, illustrated guidebook, which helped participants to think about the importance of vegetables and fruit, to set goals, choose behavioral strategies to achieve those goals, and identify and overcome barriers (Anliker et al., 1999b). During the nutrition sessions, peer educators led participants through exercises in the guidebook, facilitated discussion, and provided social support.

The program used a series of five clue cards to stimulate interest and an exchange of ideas for eating more vegetables and fruit; most were mailed to participants prior to the nutrition sessions. Each clue card posed a question related to a specific behavior being promoted (e.g., "What is a quick, easy way to combine different vegetables for dinner?"). Participants were asked to write their ideas on the back of the clue card and bring it to the next session, where it was used as a focus for discussion and as an introduction to the food demonstration. Other materials included tip sheets, a booklet of recipes submitted by participants, a children's activity book focused on vegetables and fruit, a videotape showing children singing about vegetables and fruit, and a refrigerator magnet with the program's logo.

Direct mail/tailored letters. Because there were limited opportunities for personal contact with WIC clients, direct mail was also used as an intervention. Over 6 months, the peer educators sent participants four different tailored letters, each accompanied by a tip sheet and a clue card. The letters were tailored to participants' pregnancy status, baseline stage of change, attendance at nutrition sessions, and individual goals for eating more vegetables and fruit.

Barriers to Working With WIC

The strong support received from the director of the Maryland WIC program minimized the number of barriers faced by the study. The greatest barrier stemmed from the varying ways that the WIC program is implemented, such as differing number of days the site was open and available days for picking up vouchers. Researchers evaluated each site to identify these differences and worked closely with WIC staff to implement the program. Physical limitations at some locations presented another barrier, and some sites had to be excluded due to insufficient space. A third barrier was concern by some WIC staff that the program would require additional work; this was overcome by assuring WIC administrators that

little or no additional work burden would fall on staff members as a result of the program.

Results From the Maryland WIC 5 A Day Promotion Program

Recruitment took place at the WIC sites during voucher pickup and certification. Overall, the acceptance rate was 66 percent during intervention phases and 87 percent during control phases (Havas et al., 1998). A total of 3,122 participants enrolled at 15 of the 16 sites. The peer educator at one site did not follow the study's quality control guidelines during the control phase; therefore, data from that site for both the intervention and control phases were excluded from the analyses.

Overall, the majority of participants were African-American (55 percent), younger than 30 years of age, single, and unemployed (see Table 2). Slightly more intervention participants than controls were African-American, on food stamps, or both, while a lower percentage of intervention participants worked. Attendance varied by site (Damron et al., 1999). Overall, 19 percent of participants attended all three sessions, 14 percent attended two sessions, 20 percent attended one session, and 46 percent attended no sessions (range = 31 to 58 percent).

The post-survey was completed by 75 percent of intervention participants and 76 percent of control participants. Completion rates for the followup survey 1 year after the end of Phase 1 were 64 percent among intervention participants and 60 percent among control participants.

At both the site and individual levels, comparisons were made between the intervention and the control participants (within site) on individual consumption changes and on other outcomes as well. All data were analyzed using intention-to-treat analyses. Site-level analyses were based either on site means (for continuous variables) or site proportions (for dichotomous variables); both means and proportions were treated as continuous in the analysis of the 15 sites. Paired *t*-tests were used to compare intervention and control groups on the mean change within sites regarding scores on intake, attitude, self-efficacy, knowledge, and social support.

Vegetable and fruit baseline mean consumption levels for the intervention and control participants were 3.88 servings (+0.11) and 4.2 servings (+0.10), respectively (Havas et al., 1998). At the end of each program phase, both intervention and control participants showed a mean increase in daily consumption of vegetables and fruit—an increase of 0.56 serving (+0.11) among intervention participants and an increase of 0.13 serving (+0.17) among control participants. The difference between the mean changes for the intervention and control participants was highly significant ($p = 0.002$). Subgroup analyses showed that the largest increases occurred in women who were White, younger than age 30, high school graduates, married, unemployed, in school, or nonsmokers and who were in the precontemplation, contemplation, and preparation stages. Intervention participants also showed significant improvements in knowledge, attitudes, self-efficacy, and social support for consuming more vegetables and fruit compared to control participants.

There was a strong relationship between attendance at the nutrition sessions and changes in consumption of vegetables and fruit. Women who attended no sessions increased consumption by 0.15 serving (+0.15); those who attended one session increased by 0.68 serving (+0.21); those who attended two sessions increased by 0.91 serving (+0.25); and those who attended all three sessions increased by 1.25 servings (+0.22) (p for trend = 0.02).

A year after completion of the Phase 1 postsurvey, mean consumption of vegetables and fruit had increased even further—an additional 0.27 serving (+.09) among intervention participants and an additional 0.27 serving (+.06) among control participants. The difference in mean change in vegetable and fruit consumption from baseline to the 1-year followup survey between the intervention and control participants remained highly significant ($p = 0.004$).

Lessons Learned

Numerous lessons were learned. First, having sites with a large number of WIC clients is a critical factor in recruiting. Second, no two WIC sites are the same in terms of procedures, space, and clientele, factors that can adversely affect responses to intervention programs. Third, getting WIC clients to attend nutrition education sessions is very difficult. Fourth, simpler educational approaches work best. Fifth, peers can give great guidance on educational interventions. Sixth, although peers can be highly effective, many have problems themselves,

and they may require considerable training (Anliker et al., 1999a). Seventh, getting clients to complete final surveys requires great effort and persistence. Eighth, the strong support of the State WIC director greatly facilitated the successful implementation of the project. Ninth, even though this was the first randomized WIC trial to demonstrate positive outcomes, translating this success into further dissemination by the national WIC program has proven elusive.

Implications for Further Research and Dissemination

The positive changes generated by the Maryland WIC 5 A Day Promotion Program were not equally distributed among the various demographic groups, although one must be cautious about subgroup analyses. Results showing that there were statistically significant changes only among certain subgroups (e.g., Whites) and those with at least a high school education are of some concern. Most of the project's peer educators were African-American; all had a high school diploma or a general equivalency degree. It appears that they were less successful in motivating African-American and less-educated participants to change consumption rates. However, it should be noted that the initial consumption level of African-Americans was higher than for Whites and that African-Americans' consumption did increase and remained higher following the intervention (Havas et al., 1998). Further research is needed, particularly regarding the less educated.

Nonattendance at the WIC nutrition sessions is a major concern. Despite repeated letters, invitations, and telephone calls, the project staff were unable to overcome barriers, such as lack of transportation, work schedules, lack of interest, and negative attitudes toward WIC's nutrition education; these barriers repeatedly were cited, both in the postsurvey and in focus group discussions. This greatly impeded the ability to cause larger changes in behavior through the intervention sites. Most intervention site participants who did not return postsurveys were nonattendees; intention-to-treat analysis compelled the project researchers to assume no change for these individuals, thereby diluting the larger increases seen among attendees. How to increase attendance rates remains an unanswered question. It should be noted, however, that low attendance is a common phenomenon in health promotion programs (Damron et al., 1999).

The North Carolina Black Churches United for Better Health Project

Overview and Design

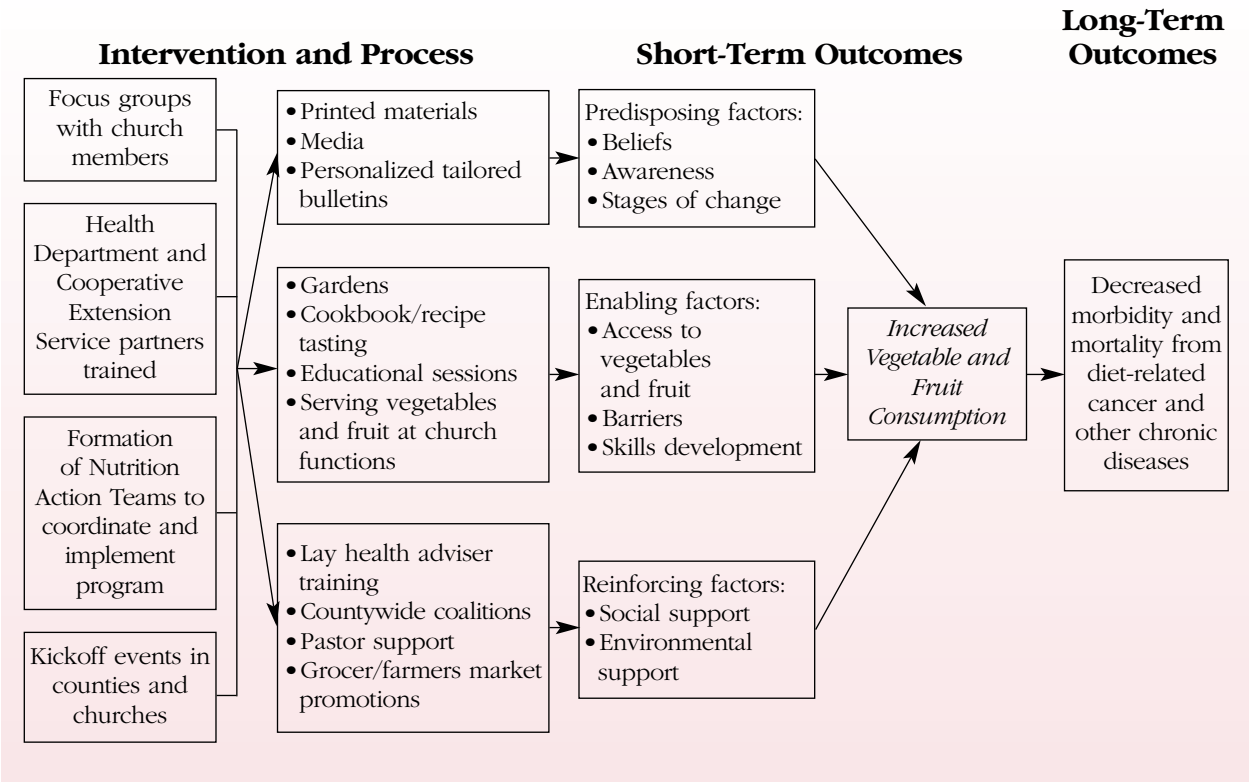
North Carolina lags behind most other States in meeting the 5 A Day target. It ranked 48th out of 50 States in mean vegetable and fruit consumption, according to 1996 Behavioral Risk Factor Surveillance System (BRFSS) data (BRFSS, 1996).

The North Carolina Black Churches United for Better Health (BCUBH) project was the only one of the nine community research studies that specifically targeted African-Americans, focused on rural populations, and used churches as a channel for intervention. The project also represented a large-scale partnership between multiple institutions, including the North Carolina Department of Health and Human Resources, University of North Carolina, the Duke University Medical Center, North Carolina State University, local health departments, the U.S. Department of Agriculture's Cooperative Extension Service, and 50 churches.

The study's main aim was to increase vegetable and fruit consumption by at least 0.5 daily serving. The primary methods were to heighten awareness and beliefs about the importance of eating vegetables and fruit for health and to enlist social and environmental support among church members for increasing consumption. This multicomponent intervention used an ecological framework, targeting activities at the individual, social network, and community levels of change. The intervention was theory-based, using concepts from the Stages-of-Change Model (also called the Transtheoretical Model) as well as from Social Cognitive Theory, social support, and the PRECEDE-PROCEED Model (Bandura, 1989; Campbell et al., 1998; Eng and Hatch, 1991; Green and Kreuter, 1991) (see also Appendix D). A conceptual model for the study is shown in Figure 1.

The study population comprised members of 50 predominantly African-American churches in 10 rural, eastern North Carolina counties. These counties have higher-than-average rates of cancer morbidity and mortality and have minority populations of at least 30 percent. The study employed the

Figure 1. Black Churches United for Better Health Program: Conceptual Model



randomization-to-intervention or delayed-intervention conditions, using a stratified one-stage cluster sample of churches within pair-matched counties. First, counties were pair-matched and randomized to intervention or delayed-intervention (no program until final survey completed) conditions. Within each county, churches were inventoried, and five churches were randomly selected to participate. African-American churches were identified based on information from key informants, denominational lists, and information from pastors. Stratification was conducted based on membership size, because larger churches tend to have more resources and a more socioeconomically advantaged population compared to smaller churches (J. Hatch, North Carolina Central University, personal communication).

In each county, two churches were selected from the small church stratum (those with fewer than 100 members), and three were selected from the large church stratum (those with 100 or more members), with random replacements for 12 initially chosen churches that declined to participate. One small intervention church dropped out midway through the project, leaving 49 churches in the study for followup. Each church minister provided a list of active adult members, defined as those participating in worship services or other church activities at least once per month. The survey sampling frame included all active members whose names were provided on these lists. As partners in the BCUBH project, all intervention churches received funds from the project to implement the 5 A Day activities, plus a smaller discretionary amount for general church needs. Delayed-intervention churches received only the discretionary funds.

Formative Research

Because of concerns about cultural sensitivity and the appropriateness of the interventions, the study conducted qualitative research with members of the target population. Six focus groups were conducted during the first year to identify and elicit attitudes, beliefs, and behaviors related to health, cancer, and vegetables and fruit, as well as barriers and motivators related to improving consumption. Focus groups were conducted separately by gender and were led by a trained moderator. The interviews were audiotaped and subsequently

transcribed, coded, and analyzed using a textual analysis software program, version 4.0 of the ETHNOGRAPH (Siedel et al., 1995).

Focus group discussions showed that the word "cancer" was associated with deterioration, pain, suffering, and death. Most people felt that medical treatment could help, but that ultimately, the outcome of living or dying from cancer was in God's hands. As one man stated, "Cancer's one thing; if it gets too far on you, no matter how strong your mind is, you're going to leave here, unless the Lord works a miracle." Many people expressed the belief that cancer cannot be prevented, but they believed that there are precautions that can be taken to decrease cancer risk. These precautions include eating healthy foods, exercising properly, and seeking medical care. They also felt that spiritual health, prayer, and being close to God can help people avoid illness. There was skepticism expressed regarding scientific research and expert health advice reported in the media. The Bible was cited as a source of health and nutrition information, and pastors were deemed the most effective persons to deliver health messages to their congregations.

Participants said that vegetables and fruit are healthy and are foods that they like. Most of them described people who eat five servings a day as being healthy (with good skin, teeth, and digestion) and committed to religious faith. Eating five servings a day also evoked some negative connotations; for example, those who do so must not have any children (because with children there would be no time to eat five a day) and must need more protein (because if one eats five per day, one might not be eating enough meat). Participants also said that there was a wealth of expertise among the church members to implement health programs and that they did not want people "from Raleigh" coming in to lecture or tell them what not to eat.

These insights were vital in shaping the BCUBH intervention project. First, there was a realization that focusing too heavily on cancer would likely provoke negative reactions or fears that might reduce participation in the project. Because people recognized the importance of healthy eating and had positive attitudes toward vegetables and fruit, the study stressed positive messages about eating these foods for health benefits. It not only acknowledged that meals should not exclude meats and traditionally favored dishes but also focused on how to modify those recipes to meet the 5 A Day guidelines (see Chapter 2). Second, the findings suggested that people might be more responsive to nutrition messages that integrated spiritual and Biblical references rather than relying solely on biomedical and expert recommendations to persuade people to change. If possible, the pastor should deliver those messages, because it would be inappropriate for the research team to interfere with the religious life of the church. Finally, because church members made it clear that they wanted to use and enhance their existing resources rather than have outside experts deliver the interventions, the study used a train-the-trainer model, working with the nutrition action teams and lay health advisers to enable church members to teach each other.

Intervention Strategy

Pastor support. The committed support of pastors was recognized as essential to the success of the project. Pastor involvement was solicited in selecting the nutrition action team; reviewing educational materials for appropriateness; writing and reviewing tailored messages; and promoting the project from the pulpit with sermons, announcements, and positive messages to the congregation about the importance of healthy eating. Pastors were kept informed of all project activities. A newsletter entitled *The Body Temple* was developed specifically for pastors, and a ministerial consultant to the project periodically contacted pastors by telephone.

Nutrition action teams. Each pastor was asked to select three to seven church members to form the nutrition action team, which was responsible for organizing and implementing the 5 A Day intervention activities within that church. The nutrition action team members were generally those people recognized by the pastor as being capable of taking on leadership roles for this type of project. They received training and support from the project staff as well as from the local health department and the North Carolina Cooperative Extension Service.

Tailored bulletins. Based on participants' baseline survey information, each intervention group member received a personalized, tailored bulletin that was mailed to their home. The bulletins were formatted similarly to a church bulletin

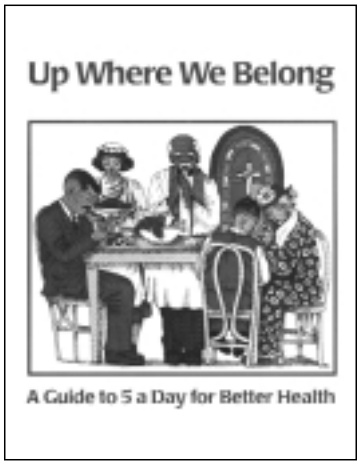

A Personal Health Bulletin for Dorothy Armstrong
from
Black Churches United for Better Health
From the Pastor's Desk

and contained individualized feedback regarding current vegetable and fruit consumption compared with the 5 A Day target, along with messages regarding stages of change, barriers, beliefs, and the level of social support. The bulletins also contained culturally appropriate recipes, tips, and a bookmark (Campbell et al., 1999a).

Lay health advisers. Church members were asked to identify people who were recognized by others as natural helpers in their church. Through this process, the research team identified those names most frequently mentioned by members within each church. In general, nutrition action team members were different from those identified as natural helpers. Potential lay health advisers were invited to attend a series of training sessions designed to build on their already-existing roles in the church. These sessions focused on refining the knowledge and skills necessary to increase social support for eating vegetables and fruit and on training lay health advisers to recognize and use the Stages-of-Change Model to help fellow members move forward. Lay health advisers learned the five major stages of change (precontemplation, contemplation, preparation, action, and maintenance). Through role-playing and discussions, these advisers practiced how to identify where fellow church members were in the change process and how to encourage them to move forward from earlier to more advanced stages (Campbell et al., 1998).

Printed materials. Church-bulletin inserts and monthly packets were developed by the project team and delivered to each intervention church to facilitate the dissemination of 5 A Day messages and activities. Brochures, posters, banners, and other written materials from NCI's Cancer Information Service (CIS) and the national 5 A Day media campaign were reviewed for appropriateness among this population, and selected materials were then distributed. In addition, the 1-800-4-CANCER phone number of CIS was promoted as both a general information hotline and as a resource where additional materials could be obtained.

Educational sessions. The team developed and conducted two main educational programs. A general 5 A Day educational session, called *Up Where We Belong*, was taught using a train-the-trainer model. The nutrition action team members from all 24 intervention churches attended a training session in Raleigh and then conducted at least two *Up Where We Belong* sessions in their respective churches. An *Up Where We Belong* 5 A Day manual was also distributed to church members who attended the sessions. The second educational session, called *Cooking With Pizzazz*, was developed and implemented primarily by the North Carolina Cooperative Extension Service in conjunction with the project team. One or two sessions were conducted for the churches in each intervention county by the local Cooperative Extension Service agent. These classes focused on how to modify cooking methods and favorite recipes to increase vegetables and fruit and to lower fat content. Local Cooperative Extension Service agents also conducted at least one class on canning and freezing vegetables and fruit for church members in each intervention county.



County coalitions. In each intervention county, coalitions were formed that included church pastors, nutrition action team members, and representatives of various local agencies, including the health department, the State Cooperative Extension Service, community colleges, and other interested parties. The coalitions received training from an expert in community coalition development. Coalitions met every 1 to 2 months on average throughout the project period and planned community events and 5 A Day publicity efforts, such as festivals and billboards.

Taste tests and cookbook. In order to encourage church members to eat more vegetables and fruit and to create social support for dietary change, a cookbook titled *A Taste of 5 A Day* was developed. A cookbook chairperson from each church worked with project staff to

coordinate the collection of favorite vegetable and fruit recipes from members. The members then worked with project staff to modify their own recipes to meet the 5 A Day criteria (i.e., at least one vegetable or fruit per serving, less than 30 percent of total calories obtained from fat, less than 480 mg sodium per serving, and limited added sugars). (See Appendix A-3, section D.) Recipe-tasting events were held in the churches to test the acceptability of the modified recipes. Each household with at least one study participant received a complimentary copy of the cookbook.

Point-of-purchase promotions. Point-of-purchase materials designed to promote locally grown produce (such as strawberries, leafy greens, cabbage, sweet and Irish potatoes, tomatoes, and blueberries) were developed in cooperation with the North Carolina Department of Agriculture and the Duke University Medical Center. Materials were distributed to church members and the grocery stores where they shopped. The types of materials distributed included seasonal recipe cards, cents-off coupons, bulletin insert advertisements, promotional posters, and farmers market and pick-your-own informational posters.

Enhancing availability of vegetables and fruit at churches. The North Carolina Cooperative Extension Service encouraged the development of church victory gardens to grow more vegetables and fruit and taught a master gardener program developed specifically with and for church members. Churches were also encouraged to include vegetables and fruit when food was served at church functions, such as at homecoming dinners, vacation Bible school, and after-worship services.

Church-initiated activities. In addition to the planned intervention program, individual churches found innovative ways to incorporate the 5 A Day message into church functions and activities. Some of these activities included convening gospel fests with a 5 A Day theme, participating in an agricultural gleaning program to salvage produce and distribute it to needy families, providing baskets of vegetables and fruit to the sick and homebound, and holding youth-oriented activities and games focused on the 5 A Day message.

Overcoming Barriers to Participation

African-Americans traditionally have been reluctant to participate in research studies. Historical abuses, such as the Tuskegee study and other instances of the misuse of African-American populations in research (Harris et al., 1996), as well as a history of discriminatory admissions policies by universities, are well known in the community. Community members, therefore, may have a built-in distrust of university researchers. Additionally, because the grant was federally funded, some churches felt uncomfortable about becoming involved due to beliefs about separation of church and State and fear of governmental interference. These barriers presented challenges for the research team in gaining entry and acceptance from the churches. The research team overcame these problems by being aware of the issues, providing full information, visiting personally with the pastors, attending church services and functions, and building trust over time. Announcements about the project at services, coupled with pastoral support, led to excellent participant response to the telephone surveys. Also, providing monetary resources to the churches demonstrated that the undertaking was truly a partnership. At a celebration dinner toward the end of the project, several pastors commented that they were initially suspicious and skeptical of the project but that they no longer felt that way because the project had followed through with its commitments and had acted in good faith.

Results of the North Carolina BCUBH Project

The final sample for the study (n = 2,519) consisted of those members who completed both the baseline and 2-year followup telephone interviews (see Table 2). A response rate of 77.3 percent was achieved. The sample was 72 percent female and 98 percent African-American and 2 percent other ethnicity. The average age of the respondents was 53.8 years, and the majority (57.6 percent) were married. Two-thirds of the sample had a high school education or higher, and the majority (58.7 percent) had household incomes

below $20,000 per year. Demographic characteristics were similar between study groups except for income level, which was higher in the delayed-intervention group. Data analyses were performed using the Statistical Analysis System Proc Mixed Procedure (Version 6.1) to account for the clustering of responses by churches within pair-matched counties, adjusting for both demographic characteristics and baseline vegetable and fruit intake (Statistical Analysis System, 1997).

Detailed results of the study have been published elsewhere (Campbell et al., 1999b). At baseline, total vegetable and fruit consumption based on the seven-item food frequency questionnaire (see Appendix E) was not statistically different between study groups. The intervention group consumed 3.68 (SE 0.09) daily servings and the delayed-intervention group consumed 3.76 (SE 0.07) servings. At the 2-year followup, the intervention group's consumption had increased significantly, but there was virtually no change in the delayed group. The difference between the groups was 0.85 serving ($p < 0.0001$). The majority of the increase was in fruit consumption (0.66 serving) rather than in vegetable consumption (0.19 serving), although both improvements were statistically significant. At baseline, approximately 23 percent of members in both study groups were already consuming five servings a day, based on the seven-item food frequency questionnaire. The proportion of participants meeting that goal at followup was 33 percent in the intervention group and 21 percent in the delayed group ($p < 0.001$).

In addition, there were significant differences in consumption-related psychosocial factors, including stages of change, self-efficacy, knowledge of the recommendations, and perceived availability of vegetables and fruit at church functions. Whereas frequency of church attendance was not associated with baseline intake, more frequent church attendance during the study period resulted in greater vegetable and fruit consumption in the intervention group. This measure may have served as a proxy for exposure to the overall intervention program. Those who attended more than once per week increased consumption by 1.3 servings compared with lesser increases for those attending once a week (+ 0.6 serving), twice a month (+ 0.5 serving), or once a month or less (+ 0.1 serving). In the delayed-intervention group, church attendance did not predict differences in consumption at followup. Participants cited certain parts of the intervention as most influential in causing them to increase vegetable and fruit intake. The activities cited as most effective by the largest percentage of participants were having more vegetables and fruit served at church functions (63 percent), having the pastor promote the 5 A Day message from the pulpit (55 percent), receiving a personalized (tailored) bulletin (53 percent), and receiving printed materials (50 percent).

Lessons Learned

The BCUBH project was, most probably, the largest randomized trial of a church-based dietary intervention ever conducted. Few interventions with religious organizations have used rigorous research designs to test effectiveness (Lasater et al., 1997). In addition, a unique aspect of the BCUBH project was the focus on rural populations and cancer prevention. Previous studies with churches, such as the Heart, Body and Soul project, focused on urban populations and cardiovascular disease prevention (Kumanyika, 1992; Voorhees et al., 1996). The positive results from this trial have encouraged a next generation of NCI-funded dietary studies with religious organizations, including the Eat for Life study in urban African-American churches in Atlanta, Georgia (Resnicow et al., 2000) and the PRAISE project in North Carolina (Boyd Switzer, principal investigator, personal communication).

A major strength of the BCUBH project was the use of interventions that capitalized not only on the church as an access point to reach African-Americans but also on other important aspects of church life. The BCUBH project developed innovative methods to engage the church membership to deliver interventions and to incorporate spiritual elements into health messages. This approach has been classified as a Level IV intervention (the most evolved model) by Lasater and colleagues, because it is considered the type of intervention with the highest involvement by church members and the most likely to achieve success (Lasater et al., 1997).

In delivering health-based messages through such channels, it is important to remember the primacy of the mission, the goals of the church, and the pastor's role as the recognized head of this institution. Therefore, to integrate health-based programs effectively within the church environment, ample time and effort are necessary

to garner the support of the pastor and other church leaders. Potential barriers can be lessened by utilizing program staff members who are familiar with the tenets and practices of African-American churches.

In the BCUBH project, field coordinators and project directors were active church members and were of African-American heritage. Furthermore, a ministerial consultant who was hired provided effective liaison services between the churches and the research team.

One of the major lessons learned in implementing the 5 A Day Program within African-American churches was the great amount of time and effort needed to nurture and promote the project and to sustain a positive relationship between church members and the research team. Partnering with churches necessitates flexibility and responsiveness to variations among churches in factors such as mission, resources, and processes of decision-making. Such flexibility, although vital to working within this community channel, can also limit the researcher's ability to ensure standardization and strict fidelity to an intervention protocol and timeline.

More people provide feedback, more decision points are necessary, and projects are therefore slower, as they require more time and resources. Such projects truly represent a partnership between the community and the health care and research team and therefore are apt to make a greater impact.

Because such interventions are so time- and resource-intensive, issues of generalizability are important to consider. Where research and dissemination funds are limited, it may not be possible to deliver an intervention of the same intensity, time, and number of components. Future research should address issues of dissemination, such as the optimum methods, costs, and effectiveness of delivering this type of church-based intervention on a broader scale. Currently, the American Cancer Society is funding the adaptation and dissemination of a program based on a combination of intervention strategies from the BCUBH project and the Eat for Life project (Ken Resnicow, Principal Investigator, Emory University, personal communication). This program will launch a church-based nutrition initiative by the American Cancer Society that will be delivered via its national network of local affiliates and volunteers. As a critical part of this effort, NCI's Health Promotion Branch is underwriting a rigorous scientific evaluation of this adapted program.

SUMMARY AND IMPLICATIONS

Both the Maryland and North Carolina 5 A Day projects represent successful examples of innovative interventions for underserved populations. The projects recruited and retained large numbers of participants and were able to evaluate behavior change over relatively long time periods of 1 to 2 years. Despite differences in settings, target groups, and intervention attributes, certain similarities in the projects' approaches may explain their success, at least in part. These approaches are not new to health promotion research; however, these projects applied them to settings and populations that were not adequately studied in the past.

First, both projects conducted extensive formative research and listened to the target population. In each case, the formative research revealed themes and insights that enabled the researchers to tailor the interventions to fit the unique needs of the target audience. The key messages used in each project focused attention on the motivators and perceived barriers that were identified from the formative interviews.

A second common element of the projects was the use of lay individuals to deliver or teach the information, as opposed to having nutrition experts lead the education. The North Carolina BCUBH project trained nutrition action teams and lay health advisers, and the Maryland WIC project trained peer educators, most of whom were former WIC program recipients. These lay educators, because of their similarity to the target audience, were credible role models for behavior change.

Third, both projects used personalized, tailored print materials that were mailed to participants' homes. Participants in both projects considered the tailored materials to be one of the more successful intervention pieces. This suggests that, especially with lower income and minority audiences, tailored printed materials may be an effective intervention component to increase interest and awareness of a project and to promote participation in other project activities.

What are some of the implications? Clearly,

public health professionals may need to look outside of traditional health education channels, such as schools and worksites, and consider other community and public health settings to reach certain segments of the population. Even though WIC efforts are based in traditional public health settings, the findings of the Maryland study clearly show that the national WIC program would benefit from the dissemination of carefully designed and tested, theory-based programs that have been shown to be effective.

Partnering with nontraditional groups and organizations, such as churches, can be another means of reaching certain populations. The BCUBH project showed that although this can be an effective strategy, there are significant barriers and considerations involved in gaining trust and entry into such settings. In addition, programs that work with strong community institutions (such as churches) need to build upon the resources and structures already present and to strengthen and enhance those resources rather than superimpose programs and structures that will last only as long as the project funds are available.

The results of these two 5 A Day Program studies suggest that future intervention trials may be most effective when they are targeted to specific populations and when the researchers are encouraged to develop the interventions to meet the needs of the specific audience rather than using a one-size-fits-all approach. Lessons learned from these studies should be examined carefully to inform future studies that may seek to extrapolate these findings to other populations and settings.

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